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August 23, 2002

Mr. Roger Baker  
City Planner  
CITY OF BURBANK  
275 East Olive Avenue  
Burbank, California 91502

Clayton Project No. 80-98191.01

Subject: Status Report of Vapor Extraction System Operation - Lockheed-Martin  
B-1 Site – April 30 , 2002 through July 26, 2002

Dear Mr. Baker:

The following status report has been prepared by Clayton Group Services, Inc. (Clayton) for the Vapor Extraction System (VES) operation at Lockheed-Martin B-1 Site for the period between April 30, 2002 and July 26, 2002. It includes the following items:

- Background
- Clayton Field Activities
- Results of Laboratory Analysis
- Health Risk Assessment Calculations
- Conclusions

### **BACKGROUND**

Alton Geoscience conducted a "Phase I" and "Phase II" of VES effluent sampling and health risk assessment for the Lockheed-Martin B-1 facility. Phase I consisted of twelve weekly health risk reports based on samples collected between September 2, 1997 and February 9, 1998. Phase II included twelve bi-weekly health risk assessments based on samples collected between February 16, 1998 and September 9, 1998. Phase III consisted of monthly sampling between October and December 1998.

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Phase IV of the VES effluent sampling consists of VES effluent sample acquisition, laboratory analyses, and health risk assessments to be performed once per quarter for the remainder of the project. The first and second quarterly health risk assessments were provided by Alton in reports dated January 18, 1999 and May 24, 1999, respectively.

Clayton subsequently has conducted quarterly sampling of the units and has routinely reported the results. These reports were issued as follows:

- November 23, 1999, which addressed the temporary shutdown of the system on October 14, 1999 for rebound testing;
- March 13, 2000, for the period following restart of the system;
- May 16, 2000 for the period through March 2000;
- March, July 12, 2000 for the period through June 2000
- November 17, 2000, for the period through September 2000.
- February 22, 2001, for the period through January 2001
- May 31, 2001, for the period through April 2001
- August 21, 2001, for the period through August 5, 2001
- November 12, 2001 for the period through October 19, 2001
- March 29, 2002 for the period through January 28, 2002
- June 6, 2002 for the period through April 29, 2002

### **CLAYTON FIELD ACTIVITIES**

On July 26, 2002 personnel from Clayton met with Earth Tech personnel to conduct sampling of air emissions at the Lockheed-Martin B-1 Site VES. Clayton and Earth Tech personnel each collected an exhaust sample using an evacuated Summa canister, connected via a disposable Teflon® tube to the VES unit's sampling port.

During the sampling period, the exhaust flow rate was 1,410 scfm. The two stack analyzers monitoring volatile organic compound (VOC) concentration showed good

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correlation with readings of 3.85 and 3.81 ppm. The VOC emission rate readings were within acceptable operating conditions for the VES. The 15 minute and 24 hour average VOC emissions rates indicated at the time were 3.3888 and 1.9661 lbs/day, respectively.

The sample collected by Clayton was delivered to Performance Analytical, Inc. in Simi Valley, California for analysis by gas-chromatograph/mass spectrometry (GS/MS) in accordance with EPA Method TO-15.

### **RESULTS OF LABORATORY ANALYSES**

The results from the TO-15 analysis of the sample taken on July 26, 2002 indicated that twelve (12) compounds were present in concentrations above detection limits. Following are a list of these compounds and the concentrations indicated by the analysis:

<b>Compound</b>	<b>Concentration (ppmv)<sup>1</sup></b>
Acetone	0.0037
Carbon Tetrachloride	0.00078
Chloroform	0.018
Cis-1,2-Dichloroethene	0.024
Trans-1,2-Dichloroethene	0.0011
1,1-Dichloroethene (DCE)	0.140
Freon 11 (Trichlorofluoromethane)	0.009
Freon 113 (Trichlorotrifluoroethane)	0.065
1,1-Dichloroethane	0.00088
1,1,1-Trichloroethane	0.012
Trichloroethene	0.290
Tetrachloroethene	0.012

<sup>1</sup> ppmv = parts per million by volume

These results reflect a slight increase in the total VOC concentration as well as the number of constituents detected. This is most likely due to the degradation of the PCE and TCE solvents into shorter chain chlorinated compounds. Overall the total VOC concentration range remains at low levels relative to the historical trend.

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Using the analytical data, an overall VOC emission rate of 0.387 lb/day was calculated. This value is lower than the previously discussed 24 hour average VOC reading (1.9661 lbs/day) provided by the continuous monitoring system. However, both the monitored and calculated VOC emission levels are well below the Conditional Use Permit (CUP) limit of 9.8 pounds per day. These results, along with the previous calculated total VOC emissions for the unit, were plotted on Figure 1. Vinyl chloride was not detected in the sample taken. Therefore, its CUP limit of 0.14 pounds per day was not exceeded.

### **HEALTH RISK ASSESSMENT CALCULATIONS**

In accordance with the CUP, the stack concentrations of each constituent and the exhaust flow rates were used to calculate the excess cancer risk resulting from operation of the VES. The first risk calculation was to determine the risk if the unit was operated for a lifetime period of 70 years, evaluating the risk to both workers and local residents for those chemicals specified in SCAQMD Rule 1401, as adopted at the time the unit was permitted. The second risk calculation was to determine the risk to both workers and local residents for the life of the project (the 8.5 year operating period), for all detected chemicals for which carcinogenic risk factors are available.

The resulting cancer risk calculations for both conditions indicated an acceptable Maximum Individual Cancer Risk (MICR) significantly less than one in one million. The results from these calculations, along with the MICR results from previous calculations for the unit, are presented on Figures 2 and 3, for 70 year and 8.5 year calculations respectively.

### **CONCLUSIONS**

Based on the results of the information gathered and samples taken on July 26, 2002, the following conclusions can be made:

VOC emissions from the VES are well below the CUP limit of 9.8 pounds per day. Since vinyl chloride was not detected, its CUP limit of 0.14 pounds per day was not exceeded. VOC emission rates have had significant fluctuations during the last two year period but remain well below those during the initial startup of the unit. These levels may be a result of eventual desiccation (drying) of clay layers due to constant long term air flow resulting in the increased volatilization of VOC components, particularly TCE and PCE.

Excess cancer risks (MICR) were less than one in one million for workers and local residents, using both 70-year lifetime and 8.5-year operating period risk calculations.

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VOC concentrations in the extracted vapor are now approaching those observed prior to the rebound testing in October 1999. It appears the system is just doing its job removing underground contaminants. The fluctuations may continue for some time but should eventually reach an asymptotic level as residual contaminant levels are reached.

If you have any questions or require additional information regarding this status report, please contact us at (714) 431-4100.

This report prepared by:

George C. Wissig, Ph.D., R.G., R.E.A.  
California Registered Geologist No. 5386  
Environmental Services

This report reviewed by:

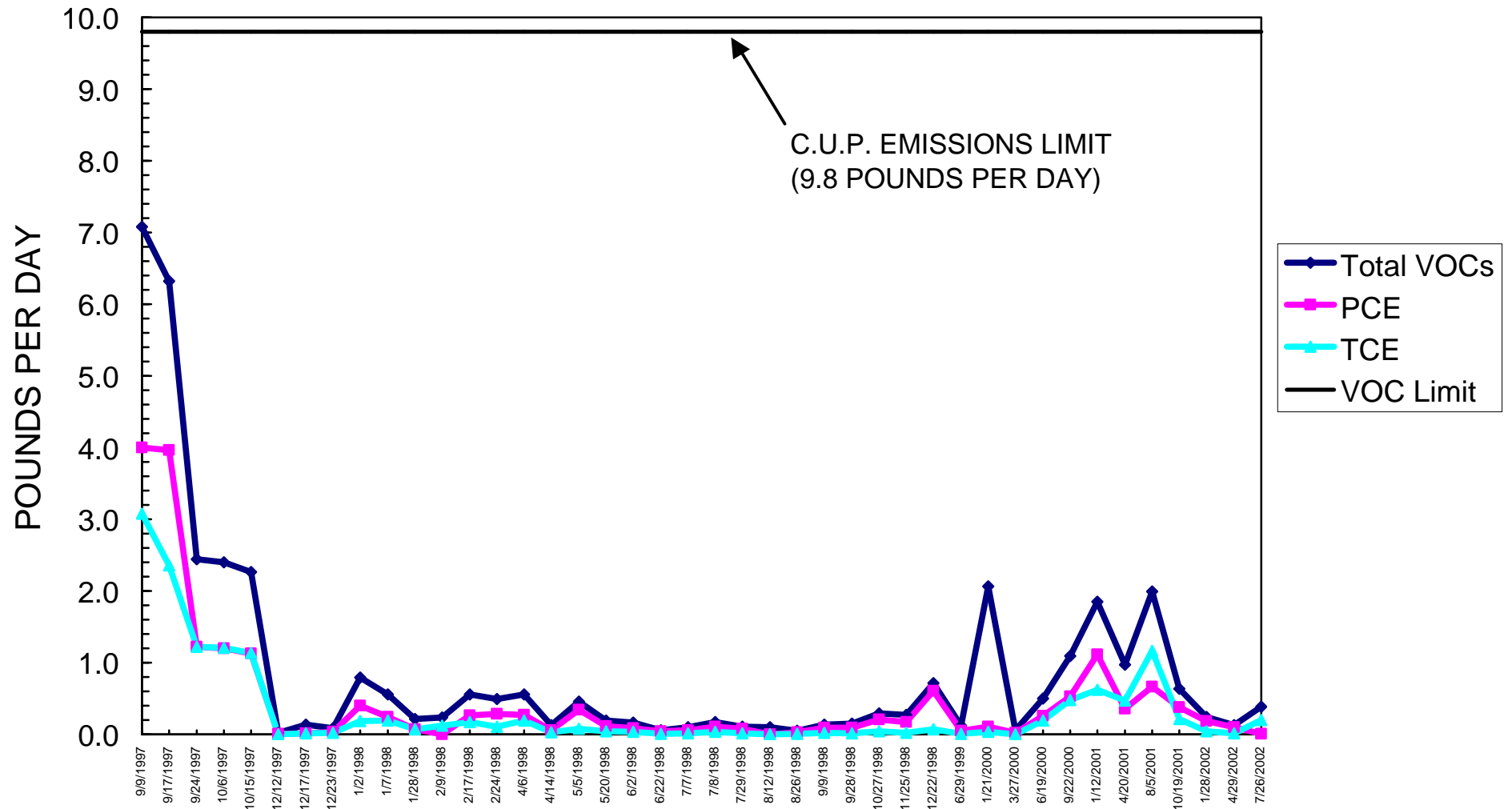
A handwritten signature in cursive script that reads 'Martin L. McClintock'.

Martin L. McClintock, P.E. No. 5025  
Project Engineer  
Environmental Services

Attachments: Figure 1 - Daily VOC Emissions  
Figure 2 - Human Health Risk (70 Year Lifetime)  
Figure 3 - Human Health Risk (8.5 Year Operating Period)  
Laboratory Report

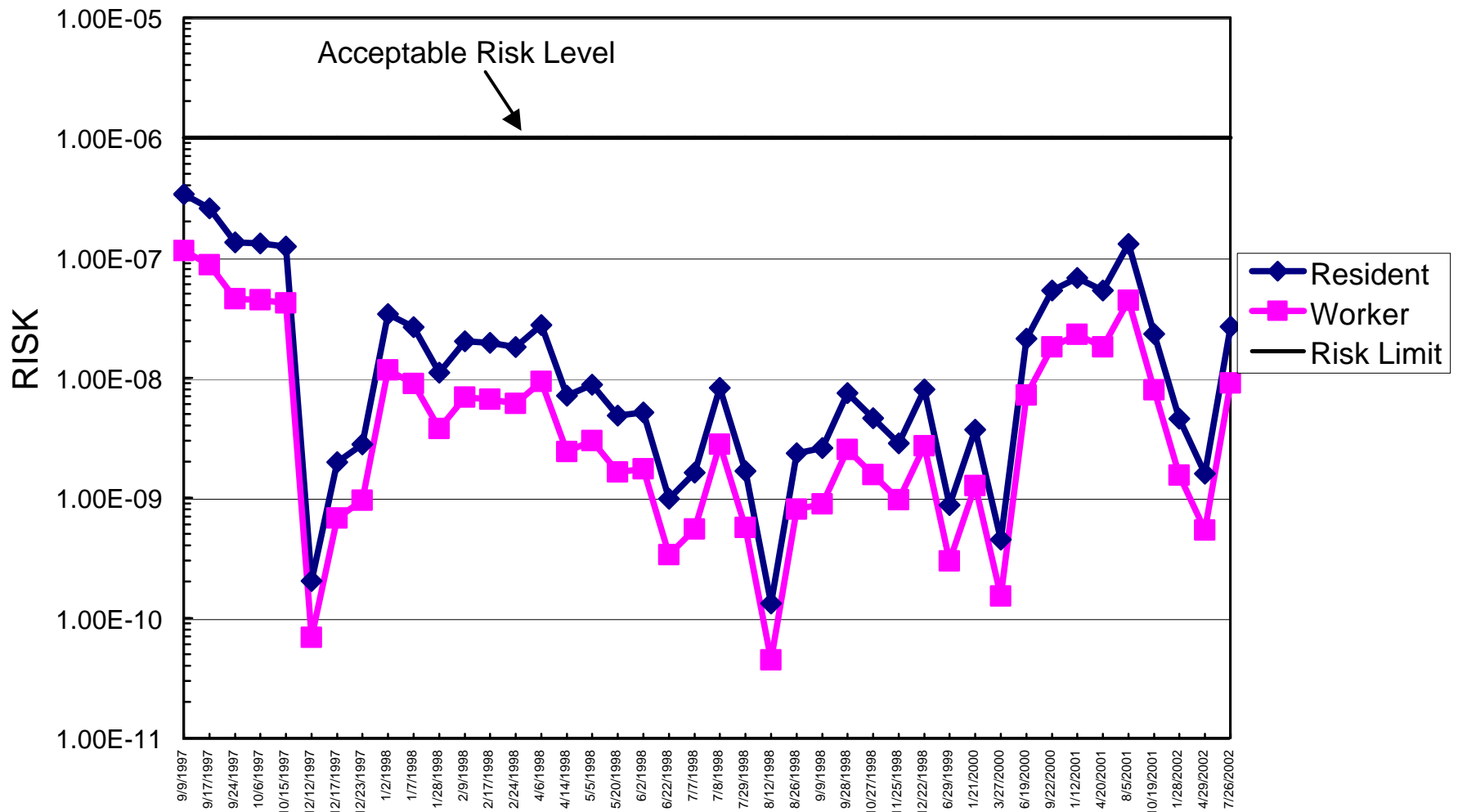
cc: Ms. Stacey Ebner, South Coast Air Quality Management District  
George Illes, South Coast Air Quality Management District

**FIGURE 1 - DAILY VOC EMISSIONS**  
**LOCKHEED B-1 VES**  
**Independent Monitoring Data**



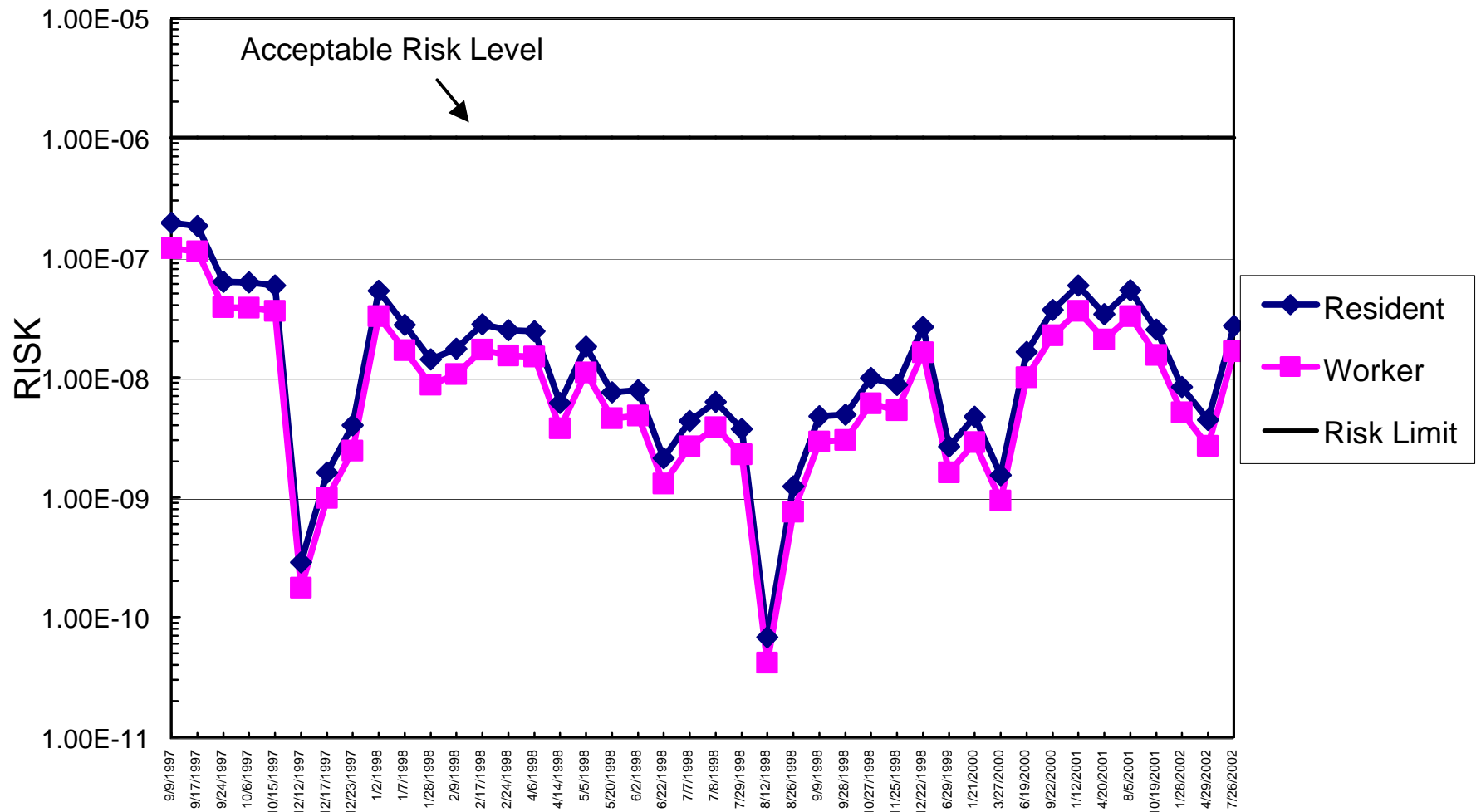
**FIGURE 1**

**FIGURE 2 - HUMAN HEALTH RISK  
LOCKHEED B-1 VES  
SCAQMD RULE 1401 CHEMICALS  
HYPOTHETICAL 70 YEAR LIFETIME**



**FIGURE 2**

**FIGURE 3 - HUMAN HEALTH RISK  
LOCKHEED B-1 VES  
DURING 8.5 YEAR OPERATING PERIOD**



**FIGURE 3**



## RESULTS OF ANALYSIS

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**Client:** Clayton Group Services  
**Client Sample ID:** B-1-VES-072602  
**Client Project ID:** City Of Burbank/80 98191.00

PAI Project ID: P2201425  
 PAI Sample ID: P2201425-001

Test Code: EPA TO-15  
 Instrument ID: HP5972/Tekmar AUTOCAN Elite  
 Analyst: Christy Saint  
 Sampling Media: Summa Canister  
 Test Notes:  
 Container ID: SC00298

Date Collected: 7/26/02  
 Date Received: 7/29/02  
 Date(s) Analyzed: 7/30/02  
 Volume(s) Analyzed: 1.00 Liter(s)  
 0.10 Liter(s)

Pi 1 = -8.1 Pf 1 = 3.5

D.F. = 2.76

CAS #	Compound	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV	Data Qualifier
74-87-3	Chloromethane	ND	2.0	ND	0.97	
75-01-4	Vinyl Chloride	ND	2.0	ND	0.78	
74-83-9	Bromomethane	ND	2.0	ND	0.52	
75-00-3	Chloroethane	ND	2.0	ND	0.76	
67-64-1	Acetone	8.7	2.0	3.7	0.84	
75-69-4	Trichlorofluoromethane	51	2.0	9.0	0.36	
75-35-4	1,1-Dichloroethene	540	2.0	140	0.50	
75-09-2	Methylene chloride	ND	2.0	ND	0.58	
76-13-1	Trichlorotrifluoroethane	490	2.0	65	0.26	
75-15-0	Carbon Disulfide	ND	2.0	ND	0.64	
156-60-5	trans-1,2-Dichloroethene	4.2	2.0	1.1	0.50	
75-34-3	1,1-Dichloroethane	3.6	2.0	0.88	0.49	
1634-04-4	Methyl tert-Butyl Ether	ND	2.0	ND	0.55	
108-05-4	Vinyl Acetate	ND	2.0	ND	0.57	
78-93-3	2-Butanone (MEK)	ND	2.0	ND	0.68	
156-59-2	cis-1,2-Dichloroethene	96	2.0	24	0.50	
67-66-3	Chloroform	86	2.0	18	0.41	
107-06-2	1,2-Dichloroethane	ND	2.0	ND	0.49	
71-55-6	1,1,1-Trichloroethane	63	2.0	12	0.37	
71-43-2	Benzene	ND	2.0	ND	0.63	
56-23-5	Carbon Tetrachloride	4.9	2.0	0.78	0.32	
78-87-5	1,2-Dichloropropane	ND	2.0	ND	0.43	

ND = Compound was analyzed for, but not detected above the **laboratory reporting limit**.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the reference method.

## RESULTS OF ANALYSIS

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 Verified By: \_\_\_\_\_ Date: \_\_\_\_\_

**Client:** Clayton Group Services  
**Client Sample ID:** B-1-VES-072602  
**Client Project ID:** City Of Burbank/80 98191.00

PAI Project ID: P2201425  
PAI Sample ID: P2201425-001

Test Code: EPA TO-15  
Instrument ID: HP5972/Tekmar AUTOCAN Elite  
Analyst: Christy Saint  
Sampling Media: Summa Canister  
Test Notes:  
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CAS #	Compound	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	Result ppbV	MRL ppbV	Data Qualifier
75-27-4	Bromodichloromethane	ND	2.0	ND	0.30	
79-01-6	Trichloroethene	1,600	2.0	290	0.37	
10061-01-5	cis-1,3-Dichloropropene	ND	2.0	ND	0.44	
108-10-1	4-Methyl-2-pentanone	ND	2.0	ND	0.49	
10061-02-6	trans-1,3-Dichloropropene	ND	2.0	ND	0.44	
79-00-5	1,1,2-Trichloroethane	ND	2.0	ND	0.37	
108-88-3	Toluene	ND	2.0	ND	0.53	
591-78-6	2-Hexanone	ND	2.0	ND	0.49	
124-48-1	Dibromochloromethane	ND	2.0	ND	0.23	
106-93-4	1,2-Dibromoethane	ND	2.0	ND	0.26	
127-18-4	Tetrachloroethene	82	2.0	12	0.30	
108-90-7	Chlorobenzene	ND	2.0	ND	0.43	
100-41-4	Ethylbenzene	ND	2.0	ND	0.46	
136777-61-2	<i>m,p</i> -Xylenes	ND	2.0	ND	0.46	
75-25-2	Bromoform	ND	2.0	ND	0.19	
100-42-5	Styrene	ND	2.0	ND	0.47	
95-47-6	<i>o</i> -Xylene	ND	2.0	ND	0.46	
79-34-5	1,1,2,2-Tetrachloroethane	ND	2.0	ND	0.29	
541-73-1	1,3-Dichlorobenzene	ND	2.0	ND	0.33	
106-46-7	1,4-Dichlorobenzene	ND	2.0	ND	0.33	
95-50-1	1,2-Dichlorobenzene	ND	2.0	ND	0.33	

ND = Compound was analyzed for, but not detected above the **laboratory reporting limit**.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the reference method.

Verified By: \_\_\_\_\_ Date: \_\_\_\_\_